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TWO NEW GENERA AND TWENTY-TWO NEW SPECIES OF CRABS FROM JAPAN

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During the past two or three years, a considerable number of crab specimens from the central and southern districts of Japan have been sent to the author for identification or as gifts. Collections were made either along the shore, from the refuse of lobster nets in shallow water or from fishing trawlers working on the continental shelf. The main sources of materials were: a collection from S. Yamamoto and pupils (Nagashima High School) along the coast of Kii Nagashima, Mie Prefecture, obtained from lobster nets; the collection of the late Mitsunosuke Ozaki, which includes more than 300 species collected by him along the coast of Kii Minabe, Wakayama Prefecture, during his 20 years of work; Katsushi Sakai's collection from off Mimase, Tosa Bay, which includes many previously unrecorded species from Japan, mostly obtained by trawling; Miyoshi Matsuo's collection from the mud flat of Ariake Bay, Nagasaki Prefecture; and a collection from Katsushi Sakai and Hirosuke Yamada from the coral reef of Yoron Island, the southernmost island of the Amami Group.

Besides these, some new species were donated by Dr. T. Odawara and Mr. H. Hayashi of the Odawara Carcinological Museum, Tokyo, and some species were obtained by the author himself during a collecting trip to Mikawa Province, Kii Peninsula, Tosa Bay and Ariake Bay.

The present paper describes the following 22 new species belonging to 11 families and 21 genera, 2 of which are new:

Fam. DROMIIDAE

Cryptodromia cristatipes new species

Fam. LEUCOSIIDAE
Arcania sagamiensis new species
Leucosia mimasensis new species
Fam. HYMENOSOMIDAE
Neorhynchoplax ariakensis new species
Fam. MAJIDAE
Epialtus orientalis new species
Sphenocarcinus bidens new species
Chlorinoides tosaensis new species
Leptomithrax kiiensis new species
Maja nagashimaensis new species
Fam. PARTHENOPIDAE
Parthenope (*Pseudolambrus*) *ozakii* new species
Fam. CANCRIDAE
Cancer nadaensis new species
Fam. PORTUNIDAE
Benthochascon elongatum new species
Thalamita yoronensis new species
Fam. XANTHIDAE
Neoliomera acutidens new species
Neoliomera richteroides new species
Planopilumnus minabensis new species
Heteropilumnus mikawaensis new species
Fam. GONEPLACIDAE
Carcinoplax tomentosa new species
Psopheticoides sanguineus new genus and species
Fam. PINNOTHERIDAE
Orthotheres turboe new genus and species
Sakaina incisa new species
Fam. OCYPODIDAE
Macrophthalmus (*Macrophthalmus*) *ceratophorus* new species

In the course of the study, the author visited numerous museums, universities and institutions in order to compare the specimens with types of related species. For the privilege of examining material and referring to literature, as well as for kind advice, the author wishes to extend his thanks to:

Dr. R. Sérène at the National Museum, Singapore; Drs. J.

Forest and D. Guinot of the Museum d'Histoire Naturelle, Paris; Dr. L. B. Holthuis of the Rijksmuseum van Natuurlijke Historie, Leiden; Dr. T. Wolf of the Copenhagen Museum, Denmark; Dr. I. Gordon of the British Museum (Natural History), London; Dr. W. L. Schmitt, Dr. F. A. Chace, Jr., Dr. H. B. Roberts of the Smithsonian Institution, Washington D.C.; Dr. F. M. Bayer and Dr. A. J. Provenzano of the Institute of Marine Sciences, Miami; Dr. J. S. Garth of the Allan Hancock Foundation, Los Angeles; and Dr. D. M. Devaney of the Bernice P. Bishop Museum, Honolulu, Hawaii.

The author also wishes to acknowledge especially the various collectors of new species for their kindness in donating the specimens.

The holotypes of the new species described in this paper are deposited in the Smithsonian Institution (SI), Washington, D.C., U.S.A.

Family Dromiidae Alcock

Genus *Cryptodromia* Stimpson

Cryptodromia cristatipes new species

Pl. I, fig. 1

Five ♂♂, 3 ♀♀, one male (SI 125866) of which is designated as the holotype. Tosa Bay, depth 150 m. Coll. by K. Sakai.

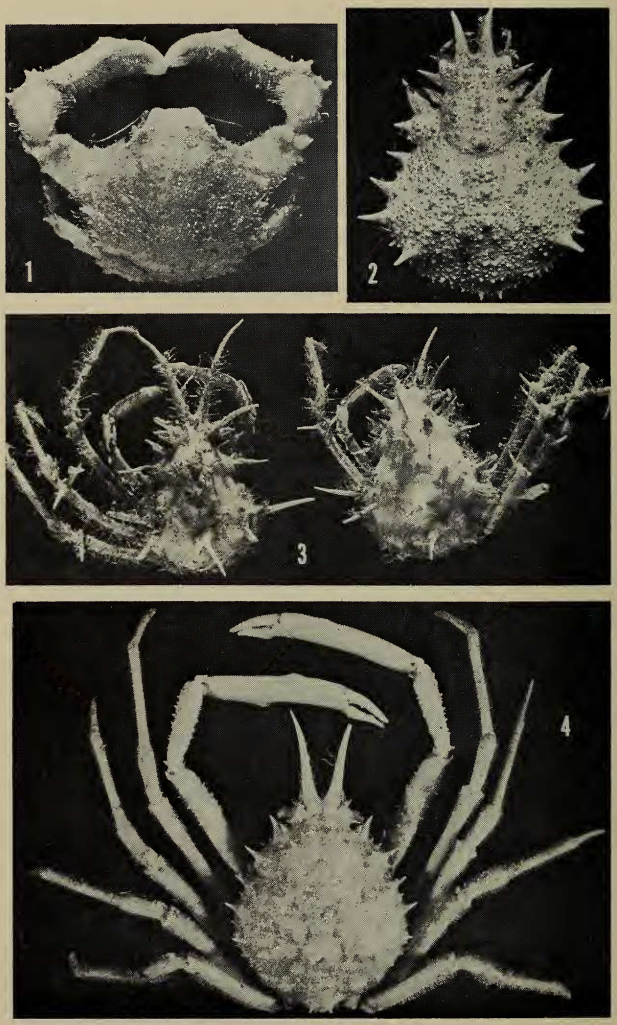
Two ♂♂. Off Mikawa Bay, Aichi Prefecture, depth 100 m. Coll. by H. Hayashi of the Odawara Carcinological Museum, Tokyo.

One ♂, 1 ♀. Kii Nagashima. Coll. by S. Tanaka of the Board of Education, Mie Prefecture.

One ♂, 1 ♀. Kii Minabe. Coll. by the late M. Ozaki.

Diagnosis: The carapace is sub-quadrilateral, a little broader than long. The dorsal surface is moderately convex, the regions being rather ill-defined and thickly covered with fine studded granules. The front protrudes strongly forward beyond the outline of the carapace; its free margin is markedly cristate and the median portion strikingly depressed, forming a tiny low triangular tooth. The lateral frontal margin is completely continuous with the outer orbital angle. The lower orbital edge is granulated, and its inner angle formed into a strong process.

The lateral borders of the carapace are subparallel. Anteriorly they are continuous with the antero-external angle of the buccal cavity, not with the outer orbital angle. Their free edge is cut into three or four laciniated teeth in front of the branchial groove, and also into three or four small ones behind the same groove. The posterolateral borders are shorter than the anterolateral, slightly concave and markedly convergent backwards. The posterior border is very narrow and straight.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The chelipeds are robust and much longer than any of the ambulatory legs, being more than twice as long as the carapace. The merus is relatively short and its outer distal surface sparingly granular. The carpus is robust and covered with granules. The upper distal border of the carpus is armed with two large processes, one at the junction with the propodus and the other at the antero-external angle. The propodus is also granulated on the upper and outer surfaces, but not markedly dentate at the junction with the movable finger.

The carpus of the first and second ambulatory legs is sulcate on the upper surface, the anterior and posterior margins being granulated. The third and fourth ambulatory legs are markedly reduced in size, and are completely dorsal in position. The last leg has a terminal pincer.

There is no epipodite on the basis of the chelipeds. The male abdomen has a platelet (vestigial uropod) on either side between the penultimate and terminal segments.

Measurements: Type male, length of carapace 19 mm, width of same 22 mm.

Relationship: The new species is closely related to *Cryptodromia ornata* Rathbun from Saya de Malha. The dorsal surface of the carapace, however, is less demarcated and the frontal lobe is, unlike that species, more strikingly cristate and its median portion only slightly dentate; in *C. ornata* the front is divided into three teeth. The type of the new species was compared with that of *C. ornata* courtesy of the Smithsonian Institution.

Family Leucosiidae Dana

Genus *Arcania* Leach

Arcania sagamiensis new species

Text-fig. 1 a, a'

One ♂, holotype (SI 125881), 1 ♀, allotype. Obtained on the beach of Manazuru, Sagami Bay.

Diagnosis: The carapace is subcircular in outline, a little longer than broad. There are ten prominent tubercles around the margin of the carapace, similar to the common Japanese species—*A. undecimspinosa* de Haan. The dorsal surface is thickly studded with granules and provided

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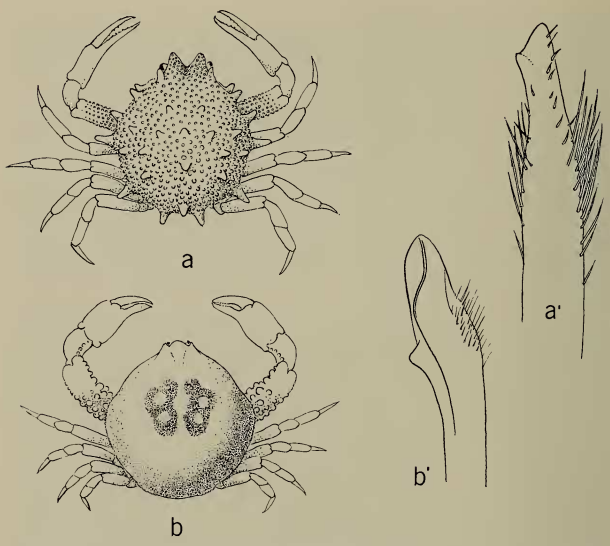
Explanation of Plate I

Fig. 1. *Cryptodromia cristatipes* new species. Male holotype, dorsal view. × 1.4.

Fig. 2. *Maja nagashimaensis* new species. Carapace of male holotype, dorsal view. × 1.2.

Fig. 3. *Chlorinoides tosaensis* new species. Left—Male holotype, dorsal view. × 2. Right—Female allotype, dorsal view. × 1.4.

Fig. 4. *Leptomithrax kiiensis* new species. Male holotype, dorsal view. × ⅔.



Text-fig. 1. a. *Arcania sagamiensis* new species. Dorsal view of male holotype. a'. Anterior male pleopod of same. b. *Leucosia mimasensis* new species. Dorsal view of male holotype. b'. Anterior pleopod of same (a × 2.5, a' × 14; b × 1.4; b' × 14).

with fifteen tubercles, of which three are in the median line, the last one being on the intestinal region near the posterior border and the others disposed symmetrically on the hepatic and branchial regions.

The front projects strikingly anteriorly and is bilobed. Each lobe ends in a process divided by a deep V-shaped median sinus. The outer orbital tooth is moderately strong. On the subhepatic region, there is a high tubercle, which can be seen from above just below the first marginal tubercle.

The chelipeds are slender; the merus is covered with longitudinal rows of granules; the fingers are a little longer than the propodus and are finely denticulated along the prehensile edge.

The terminal segment of the male abdomen is extremely long and narrow.

Habitat: Most of the species of *Arcania* are found on the bottom, 30 to 50 meters below the surface, while this new species was obtained from a rocky shore in the inter-tidal zone.

Relationship: The most closely related species is *A. gracilipes* Bell from the waters of India and Australia, but the new species has the front protruding more strongly anteriorly and the tubercles on the dorsal surface of the carapace are more numerous. In *A. gracilipes*, the cardiac region has two tubercles on median line, while the new species has only one. The type of the new species was compared with that of *A. gracilipes* by courtesy of the British Museum.

Measurements: Length of carapace in the median line, 10 mm, width 8.5 mm.

Genus *Leucosia* Fabricius

Leucosia mimasensis new species

Text-fig. 1 b, b′

One ♂, holotype (SI 125868), 1 ♀, allotype. Off Mimase, Tosa Bay, depth 120 m. Coll. by K. Sakai.

Diagnosis: Related to *L. obtusifrons* de Haan, but this new species may be easily distinguished from the former by its smaller size, the peculiarity of the colour markings of the carapace, and the different form of the anterior pleopod of the male. The outline of the carapace is typically circular and the dorsal surface evenly convex. On either side of the gastric portion, there is a pair of dark purplish markings of a rounded trilobular shape, in each of which there are three spots of light yellow, arranged fore and aft. The anterior spot is very small, the other two large and rimmed with much darker colouration.

The front is short, its anterior edge cut obtusely. The anterolateral margins are rounded, obscurely lined with depressed granules near the junction of the antero- and postero-lateral borders. The thoracic sinus is very simple and circular, rimmed with about six beaded tubercles, its base pubescent, not tuberculated.

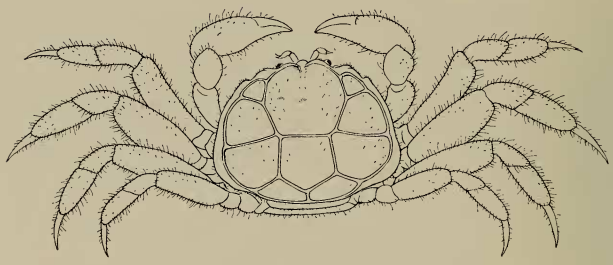
The anterior male pleopod is thickened near the distal portion and obtusely pointed, curved inwards and furnished with a few hairs.

Measurements: Length of carapace 17.9 mm, width of same 16.9 mm.

Family Hymenosomidae Stimpson

Genus *Neorhynchoplax* Sakai

Most of the species of *Neorhynchoplax* are restricted to India and its adjacent regions while the species of *Rhynchoplax* are found in Japan and China with one exception—*R. coralicola* Rathbun, which is common to Japan and Thailand. Recently Mr. Miyoshi Matsuo of the Nagasaki Middle School obtained a very small crab living as a commensal with the common Holothurian, *Protankyra bidentata* (Woodward and Barrett), which inhabits the mud flat of Shimabara, Ariake Bay, Nagasaki Prefecture. This is apparently a new species of *Neorhynchoplax* and thus constitutes the first record of the genus in Japan.



TEXT-FIG. 2. *Neorhynchoplax ariakensis* new species. Male holotype in dorsal view. (× 9)

Neorhynchoplax ariakensis new species

Text-fig. 2; 3 a-d

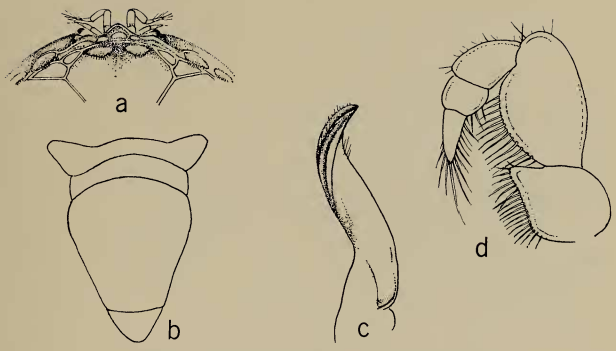
Two ♂♂, 1 ♀, one male (SI 125880) of which is designated as the holotype. Mud flat of Shimabara Peninsula, Nagasaki Prefecture. Coll. by M. Matsuo.

Diagnosis: In its general appearance and especially in the rostral teeth, this new species is closely allied to *Neorhynchoplax demeloi* (Kemp) from the Mandavi River in Portuguese India. The entire body is covered with a soft tomentum. The carapace is rounded, slightly convex and a little broader than long.

The regions of the dorsal surface are well-defined by clean-cut grooves as noted in the other members of the genus; the gastric region is the largest and is somewhat hexagonal in outline, but its anterior boundary is poorly defined. There are three median transverse tubercles on this region. The cardiac region is pentagonal with its apex directed backwards, whence a short straight groove bisects the intestinal region. In front of the hepatic region are four clearly defined tiny facets and a very small orbital region. Two of the facets are located in front of the rostral lobes and two are on the subhepatic region.

The true rostrum is a broad, low triangle projecting forwards. Behind the rostrum there are two low, obtuse lobes arranged side by side near the anterior boundary of the marginal groove. There are two low and obscure lobules on the antero-lateral borders.

The external maxilliped has the ischium longer than the merus; the former is broadened distally and the latter rounded, leaving a wide hiatus between the opposed pair of appendages.



TEXT-FIG. 3. *Neorhynchoplax ariakensis* new species. a. Anterior portion of carapace. b. Male abdomen. c. Anterior pleopod of male. d External maxilliped. (a × 18; b × 21; c × 60; d × 35)

The male abdomen is sub-triangular and composed of four discrete segments, as represented in text-figure 3b; the first segment is short and rather broader than the second; the coalesced third to sixth segments form a distally narrowed piece and the terminal segment is triangular. The anterior male pleopod is flattened distally and its apex bends backwards.

The chelipeds are not robust and are shorter than the walking legs; the propodus is rather heavy and the immovable finger is downturned proximally on the prehensile margin. The ambulatory legs are rather stout; the first pair is a little shorter than the second and third pairs, and the last pair is the smallest. Each dactylus is flat and inwardly curved, the inner border is entire.

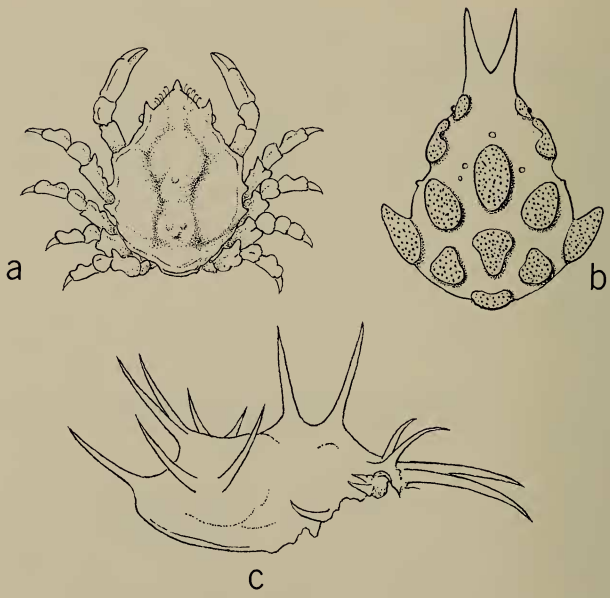
Habitat: This crab is a commensal with a holothurian, *Protankyra bidentata* (Woodward and Barrett), which is very common on the mud flat of Shimabara, Nagasaki Prefecture.

Measurements: Length of carapace 2.5 mm, width of same 3.5 mm.

FAMILY MAJIDAE ALCOCK

Genus *Epialtus* H. Milne-Edwards

No species of the genus *Epialtus* has as yet been recorded from Japan and the adjacent waters. The majority of species are restricted to the east and west coasts of North, Middle and South America. The new Japanese species described below is the first recorded occurrence of this genus in the Eastern Indo-Pacific.



Text-fig. 4. a. *Epialtus orientalis* new species. Dorsal view of male holotype. b. *Sphenocarcinus bidens* new species. Carapace in dorsal view. c. *Chlorinoides tosaensis* new species. Profile view of carapace of male holotype. (a × 3; b × 2.7; c × 1.8)

Epialtus orientalis new species

Text-fig. 4 a

One ♂, holotype (SI 125883). Kii Shirahama. Sent by Dr. H. Uchinomi of the Seto Marine Biological Station.

Diagnosis: This new species is closely related to *Epialtus sulcirostris* Stimpson from the Gulf of California, Mexico. The carapace is elongate pentagonal in outline. The rostrum is triangular with its apex prolonged into a process directed obliquely downwards and its lateral borders set with hooked hairs. The preorbital tooth is acuminate, while the external orbital tooth is rudimentary, and the supra-orbital margin entire.

The anterior half of the anterolateral border is anteriorly convergent and unarmed, while the posterior half bears three teeth, of which the

middle one is the smallest and set a little closer to the third. The posterolateral borders are slightly convex; the posterior border is very narrow with an obscure median tubercle. The dorsal surface of the carapace is almost flat, but the gastric and cardiac regions are somewhat convex.

The chelipeds are a little stouter and longer than the ambulatory legs. The merus and propodus are subequal in length and thickness, while the carpus is short and its outer edge slightly cristate; the fingers are short and unarmed. The ambulatory legs gradually decrease in length from first to last. The anterior border of the merus has two lobules, that of the carpus only a large one, and that of the propodus two smaller ones. The dactylus of all pairs is hooked at the tip.

The abdomen of the male holotype is composed of six segments, therefore this species is referable to *Epialtus,* not to *Epialtoides* Garth 1968.

Measurements: Length of carapace 9.1 mm, width of same 7.2 mm.

Genus *Sphenocarcinus* A. Milne-Edwards

Sphenocarcinus bidens new species

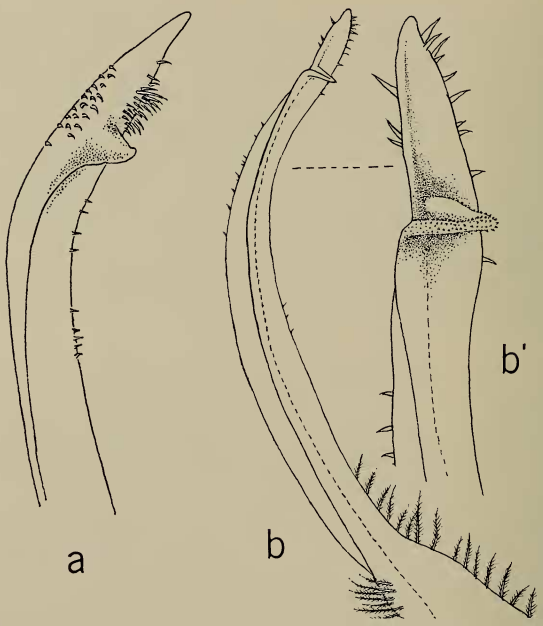
Text-fig. 4 b

Carapace only, sex unknown, holotype (SI 125884). Off Kumanonada, Mie Prefecture; depth 150–180 m. Sent by H. Kato of the Aichi-ken Fisheries Experimental Station.

Diagnosis: This new species is closely related to S. *carbunculus* Rathbun from the Hawaiian Islands in the arrangement of the protuberances of the carapace, and also to S. *stimpsoni* (Miers) from Japan to Colombo, in the form of the process at the lateral angle of the carapace.

The carapace is in the form of a rounded triangle, the rostral horns are divergent in the distal third, directed obliquely downwards. Their outer margins are subparallel.

On the dorsal surface of the carapace, there are 13 raised protuberances in all, of which three are located in the median line, one each on the gastric, cardiac and intestinal regions—the gastric one is the largest and is longitudinally oval, the cardiac one is a rounded triangle with its base directed forward and the intestinal one is transversely narrow with its middle portion constricted. The rest of the protuberances are symmetrically disposed—one on the supra-orbital margin (the smallest of all); one on the hepatic margin is narrow and invaginated in the middle; three on the branchial region, of which two are large and located on the dorsal surface, the other one at the lateral angle is developed into a large obtuse process, the tip of which projects obliquely forward. Besides these protuberances, there are a few tiny tubercles—one in front and one or two on the lateral sides of the gastric protuberance, and also one on the anterolateral border between the hepatic and branchial protuberances. There are no tubercles or protuberances on the ventral side of the carapace but a few small granules on the ridge between the subhepatic and pterygostomian regions.



Text-fig. 5. Anterior male pleopod of: a. *Chlorinoides tosaensis* new species. b, b'. *Maja nagashimaensis* new species. (a × 20; b × 8; b' × 50)

Although the abdomen and thoracic legs are missing, the species may be safely designated as new to science.

Measurements: Length of carapace 13.2 mm, width of same 9.0 mm, length of rostral horn 4.0 mm.

Genus *Chlorinoides* Haswell

Chlorinoides tosaensis new species

Pl. I, Fig. 3; Text-figs. 4 c; 5 a

Two ♂♂, 1 ♀. One male (SI 125882) is designated as the holotype. Off Mimase, Tosa Bay. Coll. by K. Sakai.

Diagnosis: This new species is closely related to *Ch. acanthonotus* Adams and White from Borneo, but the branchial regions are apparently more swollen and the rostral horns much longer, their total length being more than half that of the carapace.

As in *Ch. acanthonotus*, the supra-orbital spine is extremely long and curved posteriorly in the distal half, but unlike that species, it is simple and not bifurcate in the distal half. A long and simple spine in the middle portion of the intestinal region projects obliquely backward; in *Ch. acanthonotus*, however, it is divided into two proximally, one projecting upwards and the other horizontally backwards. The gastric region is armed with two long spines, one behind the other in the median line; the cardiac region also has two, side by side, set near to each other and diverging somewhat. One hepatic spine of medium size, projects obliquely backward and finally two very long branchial ones near the antero-external corner, project obliquely forward in one case and obliquely backward in the other.

The merus of the ambulatory legs is armed with two long spines at their distal extremity. In other respects the new species agrees well with *C. acanthonotus*.

Measurements: Length of carapace of male holotype, 21 mm, width of same 17 mm, length of rostral horn 17 mm.

Genus *Leptomithrax* Miers

In the fauna of Japan, the genus *Leptomithrax* has hitherto been represented by only two early recorded species—*L. edwardsi* de Haan and *L. bifidus* Ortmann. Each of these have the chelipeds rather robust and the carpus very short, unlike the typical species of New Zealand and Australia, in which the chelipeds are slender and the carpus is relatively long and cylindrical.

The new species described below has the chelipeds very long and slender, and the carpus is apparently longer as seen in the species of the southern hemisphere.

Leptomithrax kiiensis new species

Pl. I, fig. 4

One ♂, holotype (SI 125885). Kii Minabe, from a lobster net in shallow water. Coll. by the late M. Ozaki.

Diagnosis: The carapace is elongate pyriform and its outline, excluding the orbital and frontal portions, is narrower than in any of the Australian species. The dorsal surface is covered with a soft tomentum and numerous spinules. The spinules vary in size; the two gastric spines are on the median line, while the two cardiac ones are side by side; the two or three on the metabranchial region are most prominent.

The rostral horns are slender and long, being more than half the length of the carapace proper. The supra-orbital spine is small and the intercalated one moderate in size, but the external orbital one is very prominent and acuminate at the tip. On the anterolateral borders, there are four marginal spines—one hepatic and the others branchial.

The chelipeds are very slender and more than twice as long as the carapace proper. The merus and carpus are cylindrical and beset with

spinules, the latter about three fourths the length of the former. The propodus is markedly longer than the merus, smooth and glabrous. On the left cheliped, the propodus has a nodule on the upper and lower borders; on the right propodus, only the upper border has a nodule. Whether these nodules are due to an abnormality or are specific is not certain at present. The lower proximal border of the immovable finger has a large nodule near the proximal portion. The ambulatory legs are thickly covered with hooked hairs of almost equal length.

Measurements: Length of carapace 55 mm, that of rostral spine 24 mm, width of carapace 44.5 mm, length of cheliped 125 mm.

Genus *Maja* Lamarck

Maja nagashimaensis new species

Pl. I, fig. 2; text-fig. 5b, b′

Three ♂♂, 2 ♀♀. One male (SI 125886) is designated as the holotype: Kii Nagashima, Mie Prefecture. Coll. by Y. Yamamoto of the Nagashima High School.

Diagnosis: In the general outline of the carapace, this new species is allied to *M. japonica* Rathbun and *M. gibba* Alcock, but in the number and arrangement of the spines on and around the carapace, it is related to *M. miersi* Walker.

The carapace is markedly constricted behind the hepatic regions, and the branchial regions are well-inflated and round in outline. The dorsal surface is thickly covered with granules of various sizes. In the median line, there are two low spines, one on the gastric region and the other on the cardiac. The rostral spines are rather slender, short, well divergent apically and horizontal, not upturned as in *M. miersi* Walker or *M. spinigera* de Haan. The extra-orbital spines are very strong and their anterior edge is excavated proximally. The hepatic spine is basally confluent with the external orbital one and its tip directed obliquely backward. The four marginal spines of the branchial regions are very strong and subequal, the final one is located on the dorsal surface, as in other species of this genus. The two usual spinules of the posterior border are almost rudimentary. The palp of the antenna arises from within the orbit.

The chelipeds are robust, the merus short and distally thickened, colored with two or three irregular bands of deep purple. The carpus is robust and bears two longitudinal ridges, one median and the other on the outer margin; the propodus is strikingly swollen and smooth; the fingers are unarmed. The ambulatory legs are only sparsely hairy. The merus, carpus and propodus are also banded with deep purple.

The anterior pleopod of the male is armed with a curved hooklet near the apex as shown in text-figs. 5 b, b′.

Measurements: Length of carapace proper 33.5 mm, width of same 28.3 mm, length of rostral spine 8 mm.

Relationship: Most of the species of *Maja* have the chelipeds very slender in both sexes, the carpus being relatively long and cylindrical; in

TEXT-FIG. 6. *Parthenope* (*Pseudolambrus*) *ozakii* new species. Dorsal view of male holotype. (× 3.4)

the new species, however, the carpus is short and robust and the propodus also inflated. As regards the chelipeds, the new species thus approaches some species of *Leptomithrax*, such as *L. edwardsi* de Haan and *L. bifidus* Ortmann, while in the form of the antenna it belongs to *Maja*, the antennal flagellum arising from within the orbit. In *Leptomithrax*, the flagellum is excluded from the orbit.

FAMILY PARTHENOPIDAE ALOCK
Genus *Parthenope* Weber
Subgenus *Pseudolambrus* Paulson
Parthenope (Pseudolambrus) ozakii new species
Text-fig. 6

One ♂, holotype (SI 125887). Kii Minabe, Wakayama Prefecture, shallow water. Coll. by the late M. Ozaki.

Diagnosis: A rather small species; its nearest relative is probably *P.* (*Ps.*) *bicornis* (Flipse, 1936) from the Sea of Java, from which it may be distinguished by the peculiar lobe on the outer border of the propodus of the cheliped and by the different arrangement of the teeth and processes of the carapace.

The carapace is in the form of a rounded triangle, the dorsal surface being smooth. The gastric and cardiac regions are markedly convex and conical, each ending in a long process, of which the gastric is thick and

very long, projecting obliquely backwards, while the cardiac is a little smaller and projecting upwards.

The front is rounded triangular in outline, the margin entire. On the anterolateral borders, the hepatic portion is entire and rounded, completely merged with the external orbital angle; the branchial portion is set with 6–7 teeth, which are triangular and confluent with each other at the base. The carapace is very slightly constricted behind the hepatic margin. There is an oblique and sparingly granulated ridge on each branchial region running from the last anterolateral tooth toward the middle portion of the carapace. The posterolateral borders are almost straight and marked with a few tubercles.

The chelipeds are strikingly asymmetrical. The left is very small, each segment is slender and the fingers cross each other strikingly in the distal half. The right cheliped is robust, the merus very broad and its anterior and posterior borders cut into five or six cristate teeth, the carpus is thin and small, while the propodus is again robust, its outer border bears a very broad and round lobe at the proximal half, its interior border is finely serrated. The immovable finger has three obtuse teeth near the middle of the prehensile edge.

The ambulatory legs are very thin and the anterior and posterior borders of each segment are marked with tiny denticles.

Measurements: Length of carapace 12.1 mm, width of same 12.5 mm.

Family Cancridae Alcock

Genus *Cancer* Linné

Cancer nadaensis new species

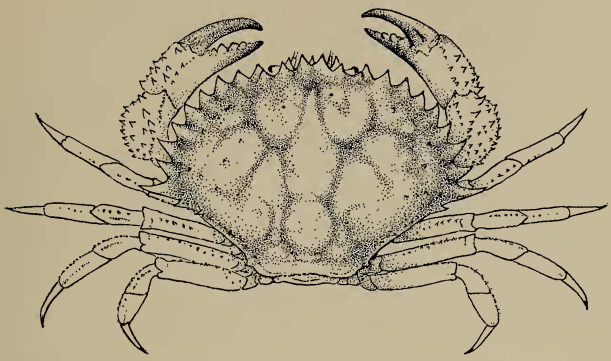
Text-fig. 7

One ♂, holotype (SI 125871). Shimogusui, Kii Province, muddy bottom, depth 30 m. Coll. by H. Hayashi of the Odawara Carcinological Museum.

Diagnosis: The new species is distinguished from any other of the Japanese species of this genus by its well-cut anterolateral teeth, and also by the sharply and uniformly spinulated carpus and propodus of the chelipeds. The carapace is about 1.5 times as broad as long and its dorsal surface is slightly areolated, with a few obscure scattered tubercles near the anterior and lateral surfaces. The front is cut into three teeth, the middle one of which is thin and on a lower level. The preorbital tooth is prominent and sharp.

The anterolateral borders are well arched and divided into nine teeth. All of the teeth are well-cut and separated from each other, their tips being acuminate and the last one largest of all and projecting sideways. On the posterolateral border, there is a small tooth just behind the last anterolateral tooth, followed by a series of tiny teeth.

The chelipeds are symmetrical. The merus is short and scarcely visible from above; the carpus and propodus are rather thickly and uniformly



TEXT-FIG. 7. *Cancer nadaensis* new species. Dorsal view of male holotype. (×1)

spinulated on the upper and outer surfaces, the spinules variable in size and irregularly arranged.

The anterior three pairs of ambulatory legs are subequal in size, the last pair being a little smaller. The anterior margins of the merus, carpus and propodus are obscurely spinulated.

Measurements: Length of carapace 32 mm, width of same 48 mm.

FAMILY PORTUNIDAE DANA

Genus *Benthochascon* Alcock

In the Indo-Pacific, the genus *Benthochascon* has been represented by a single species, *B. hemmingi* Alcock, which was originally recorded from the Andaman Sea. The second locality of this species is the Nicobars and the third Tosa Bay, Japan. A new species of this genus has recently been obtained at Izu Niijima, and is described below.

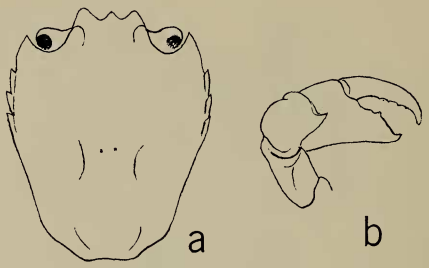
Benthochascon elongatum new species

Text-fig. 8 a, b

One ♂, holotype (SI 125869), dried, ambulatory legs missing. Izu-Niijima, one of the seven islands of Izu. Sent by T. Odawara of the Odawara Carcinological Museum, Tokyo.

One ♂ (photo), same locality. Sent by K. Suzuki of the Kanazawa Aquarium, Ishikawa Prefecture.

Diagnosis: The carapace is oblong, almost 1.2 times as long as broad. The dorsal surface is smooth and glabrous. The front is composed of three



TEXT-FIG. 8. *Benthochascon elongatum* new species. a. Carapace of male holotype. b. Right cheliped of same. (a, b × 6)

obtuse teeth, of which the median one is smaller than the lateral ones. Neither preorbital tooth or upper orbital fissures are present. The anterolateral borders are cut into four teeth, the first or external orbital tooth is very long, the second, third and fourth are smaller and subequal in size. The posterolateral borders are much longer than the anterolateral ones and slightly concave.

The basal joint of the antenna is short but longer than broad and freely movable; the flagellum is moderately long, situated in a narrow orbital hiatus.

The chelipeds are rather robust; the merus short and prismatic, the carpus subquadrate in outline, armed with a tooth at the inner angle. The propodus is high, the immovable finger very short and proximally very broad, the outline being triangular. The movable finger is long and slender, strongly curved inward in the distal half.

Measurements: Holotype, length of carapace 6.8 mm, width of same 5.5 mm.

Genus *Thalamita* Latreille

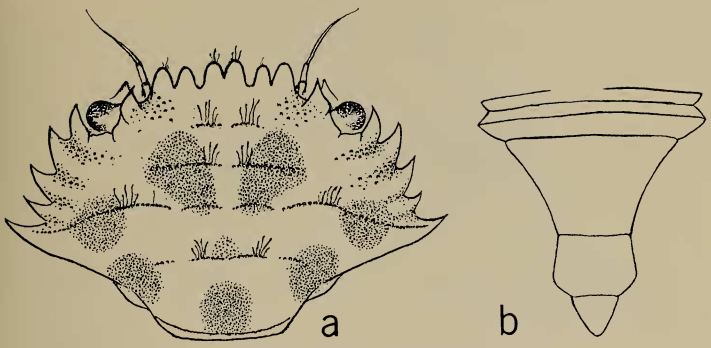
Thalamita yoronensis new species

Text-fig. 9 a, b

One ♂, holotype (SI 125870), 1 ♀, allotype. Yoron Island, Amami Group. Coll. by K. Sakai.
One ♂, 1 ♀, same locality. Coll. by Hirosuke Yamada.

Diagnosis: Related to *Thalamita picta* Stimpson from Japan to tropical Indo-Pacific and *Th. macropus* Montgomery from Abrolhos Islands, but the new species may be distinguished from them by the different features of the frontal, preorbital and anterolateral teeth.

The carapace is little more than two-thirds as long as broad. The dorsal surface is covered with thin hairs and mottled with eight brown color pat-



TEXT-FIG. 9. *Thalamita yoronensis* new species. a. Carapace of male holotype. b. Abdomen of same. (a × 3.5; b × 7)

terns in the fresh specimen. There are two pairs of transverse ridges on the gastric region, one each on the protogastric and mesogastric. Behind the usual transverse ridge connecting the last anterolateral tooth on either side, is a short obscure ridge which traverses the cardiac region.

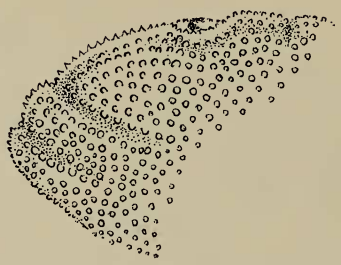
There are 6 frontal teeth, the median 2 are close together, rounded at the tip and well-produced forwards; the submedian ones are well-separated and short but also rounded at the tip; the lateral ones are again projected forward and their tips rounded. The pre-orbital edge is armed with a sharp tooth, which projects forward, not sideways as in other congeners; below this tooth an acuminate tooth at the inner angle of the inferior orbital margin is seen in dorsal view.

The five anterolateral teeth are uniformly acuminate—the first and second projecting forward, the third and fourth obliquely forward, of which the fourth is not distinctively reduced in size; the fifth is prominent, projecting strongly sideways. The posterior border is very narrow.

The chelipeds are slightly asymmetrical; the merus unarmed, the carpus with its inner angle armed with a long sharp tooth and its outer extremity with three spinules; the propodus is slightly swollen in the middle and its upper border has five teeth, of which one is proximal, two are on the inner margin and the rest are on the outer margin. The ambulatory legs are banded with dark green color; the posterior border of the propodus of the last pair is spinulated.

The penultimate segment of the male abdomen is subquadrate in outline, the lateral borders being parallel and obtusely angular at the anterolateral angle.

Measurements: Length of carapace 12.7 mm, width of same 19.0 mm.



TEXT-FIG. 10. *Neoliomera richtersi* (de Man) from Hawaii. Frontal and lateral portions of carapace. (× 1.5)

FAMILY XANTHIDAE ALCOCK
Genus *Neoliomera* Odhner

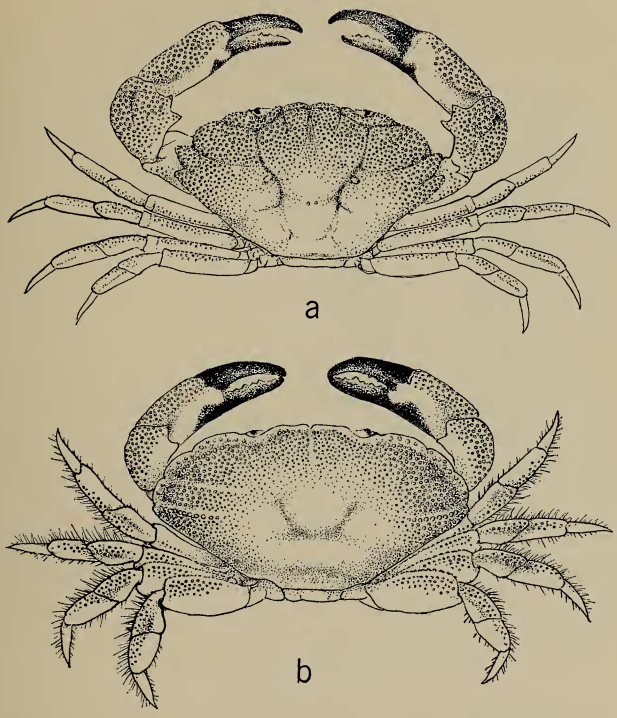
Following is a list of species of *Neoliomera* recorded up to the present:

Neoliomera pubescens (H. Milne-Edwards, 1834)
N. insularis (White, 1848)
N. variolosa (A. Milne-Edwards, 1873)
N. sundaica (de Man, 1888)
N. richtersi (de Man, 1889)
N. themisto (de Man, 1889)
N. praetexta (Rathbun, 1906)
N. sabaea (Nobili, 1906)
N. intermedia Odhner, 1925
N. nobilii Odhner, 1925
N. sakagutii Sakai, 1939 = *Atergatis granulatus* de Man, 1889 (Cf. Forest & Guinot, 1961)
N. striata Buitendijk, 1941
N. ovata Tweedie, 1950 = *Atergatis* sp. (Cf. Forest & Guinot, 1961)
N. demani Forest & Guinot, 1961
N. immigrans Edmondson, 1962 = *Atergatopsis* sp.

Forest & Guinot (1961) suggested that *N. intermedia* recorded by me from Japan (1939) was a synonym of *N. pubescens*, but I have now verified the Japanese species based upon the form of the first pleopod of male, which is quite different from that of *N. pubescens* as shown in text-figure 12 d.

According to the same authors, *N. ovata* Tweedie is not *Neoliomera* but belongs to *Atergatis*. In my opinion, *N. immigrans* Edmondson is also not *Neoliomera* but may be a species of *Atergatopsis*.

The present opportunity is taken to add two new species to this genus, which are described below.



Text-fig. 11. a. *Neoliomera acutidens* new species. Dorsal view of male holotype. b. *Neoliomera richteroides* new species. Dorsal view of male holotype. (a × 1.2; b × 2.1)

Neoliomera acutidens new species

Text-figs. 11 a; 12 c.

Two ♂♂, one of which is designated as the holotype (SI 125874). Shimogusui, Kii Province, trawled from 30–50 m. Sent by H. Hayashi of the Odawara Carcinological Museum.

Diagnosis: The nearest relatives of the new species are *N. pubescens* and *N. intermedia*, but the following particulars may be enumerated as the differences between these species.

The carapace is transversely ovoid, the dorsal surface being vaulted on the anterior one-third, but almost flat on the posterior two-thirds. The anterior and lateral surfaces are covered with depressed granules, of which those near the anterolateral teeth are larger. The meso- and metagastric regions, as well as the cardiac, intestinal and inner sub-branchial surfaces are flat and almost smooth. The grooves which define the regions are narrow but deep. In *N. pubescens*, the entire dorsal surface is uniformly covered with granules.

The frontal margin is divided into two lobes by a median fissure, each lobe being almost transversely straight. The antero-lateral borders are cut into four teeth, of which the first slants outward and is completely confluent with the outer orbital angle; the second is a little shorter and low, while the third and fourth are triangular in shape, each having a pointed apex. In *N. pubescens*, as well as in *N. intermedia*, these four teeth are rounded and not at all dentate.

The chelipeds of the male are subequal, the carpus is marked with a T-shaped groove in the anterior portion of the upper surface, and its inner angle is broadly produced, divided into obtuse teeth at the end. The propodus is laterally depressed. Its upper outer surface is longitudinally grooved and the lower surface is almost smooth. The black colour of the immovable finger extends onto the outer and inner surfaces of the propodus, but does not expand so as to encircle the whole segment.

All pairs of ambulatory legs are very slender compared with those of the species referred to above; the anterior margin of each segment is sparingly granulated, but the surface of each segment is almost smooth.

The anterior pleopod of the male is curved inward at the tip and marked with a small obtuse process, as shown in text-figure 12 c.

Measurements: Length of carapace 21 mm, width of same 37.5 mm.

Neoliomera richteroides new species

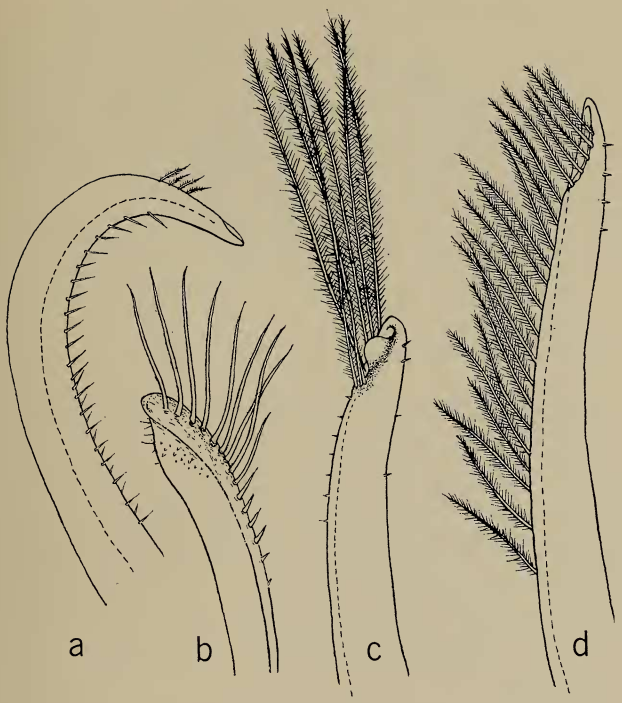
Text-figs. 11 b; 12 b.

Neoliomera richtersi Sakai 1967 (nec *N. richtersi* de Man), Researches on Crustacea, Tokyo, no. 3, p. 81, Frontispiece fig. 1 (colored).

One ♂, holotype (SI 125875). Yoron Island, Amami Group, coral reef. Coll. by K. Sakai.

Diagnosis: One male specimen obtained from the Yoron Island, which was formerly reported by the author as *N. richtersi* de Man (loc. cit.) seems to be a distinct new species. The author examined the typical *N. richtersi* from Bikini Island by courtesy of Dr. J. S. Garth at the Allan Hancock Foundation, Los Angeles, and several male and female specimens from the Hawaiian Islands identified by Edmondson, by courtesy of Dr. D. M. Devaney at the Bernice P. Bishop Museum, Honolulu.

The carapace is appreciably broader than long and the dorsal surface is thickly studded with granules of various sizes. The anterolateral borders are well arched and distinctly cristate, cut into four teeth, of which the first and second are long and lobular, obscurely divided by an indistinct

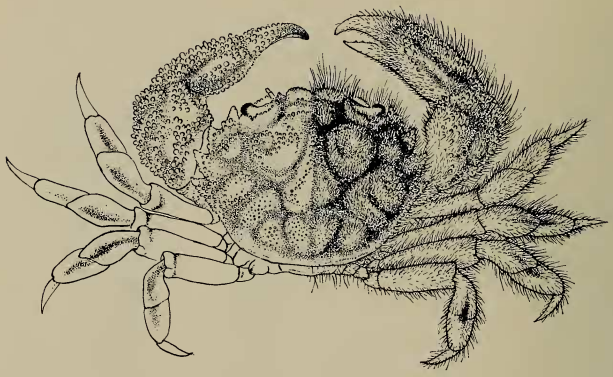


TEXT-FIG. 12. Anterior pleopod of male of: a. *Planopilumnus minabensis* new species. b. *Neoliomera richteroides* new species. c. *Neoliomera acutidens* new species. d. *Neoliomera intermedia* Odhner from Kii Peninsula. (a × 41; b × 72; c × 62; d × 62)

incision, while the third and fourth are dentiform, the former as long as the third and the latter very short. In typical *N. richtersi*, the anterolateral borders are not arcuate but slender, the first and second teeth entirely united and the third and fourth are short. The margins of these teeth are studded with sharp granules and the crest is very narrow.

The frontal and upper orbital margins are also distinctly cristate, while in *N. richtersi*, they are not cristate at all.

The chelipeds resemble those of *N. richtersi* as does the black color of the immovable finger which extends onto the surface of the propodus, enclosing the distal portion of that segment.



TEXT-FIG. 13. *Planopilumnus minabensis* new species. Dorsal view of male holotype. (× 2)

The coloration of the fresh specimen is yellow as in *N. richtersi*, having a number of whitish spots of various sizes on the carapace.

The anterior male pleopod also resembles that of *N. richtersi*, having eight long and two or three shorter hairs at the distal portion.

Measurements: Length of carapace 12.5 mm, width of same 24.0 mm.

Genus *Planopilumnus* Balss

Planopilumnus minabensis new species

Text-figs. 12a; 13

One ♂, 2 ♀♀, one male, holotype (SI 125876). Kii Minabe, Wakayama Prefecture, from the refuse of lobster net. Coll. by the author himself.

One ♂, 1 ♀. Same locality. Coll. by the late M. Ozaki.

One ♂, Shimogusui, Kii. Coll. by H. Hayashi of the Odawara Carcinological Museum, Tokyo.

Diagnosis: The entire body is thickly covered by hairs, which, on the dorsal surface of the carapace and chelipeds have a vermiform appearance, and on the ambulatory legs, are very long and fringe both borders of each segment. On denudation, the dorsal surface of the carapace is well-areolated by deep, smooth grooves. Each areola has a shallow depressed surface, which is surrounded by an obscure ridge marked with tiny granules. The front protrudes well forward, being divided into two truncate lobes, the free edges of which are granulated. The upper orbital margin is thick and has two distinct fissures. Behind the frontal lobes

there are two pairs of granulated ridges, the anterior one being transverse and the posterior one oblique.

The anterolateral border is armed with four teeth, all acuminate and sparingly granulated; the last one is a little smaller than the rest. The posterolateral borders are sub-equal to the anterolaterals, being straight and moderately convergent. The posterior border is slightly convex.

The chelipeds are robust and symmetrical; the merus is short but distally thickened and armed with a subterminal tooth on the upper ridge. The carpus is large and swollen, with a shallow dorsal and an oblique subdistal groove. The propodus is rather short but high with a dorsal groove near the superior edge, the outer surface has four longitudinal rows of granules, but the inferior surface is uniformly granulated. Both fingers are lightly pigmented, the pigment does not extend onto the surface of the propodus. The ambulatory legs are robust, thickly fringed with hairs. On denudation, the carpus has a deep groove on the upper surface and the propodus has a shallow groove on each upper and lower surface.

The abdomen is seven-segmented, the first and third terga are broadest and the terminal tergum is rounded triangular. The anterior pleopod of the male is curved in the distal portion, as figured in text-figure 12 a.

The new species is obviously related to *P. vermiculatus* (A. Milne-Edwards) from New Caledonia and also to *P. labyrinthicus* (Miers) from north and north-east Australia. However, the vermiform sculptures of the carapace of the new species is quite different and the hair on the carpus and propodus also assumes a vermiform appearance, while in the above species, these segments are simply haired.

The holotype of the new species was compared with that of *P. vermiculatus* by courtesy of Forest and Guinot at Museum National d' Histoire Naturelle, Paris.

Measurements: Holotype, length of carapace 14.8 mm, width of same 20.5 mm.

Genus *Heteropilumnus* de Man

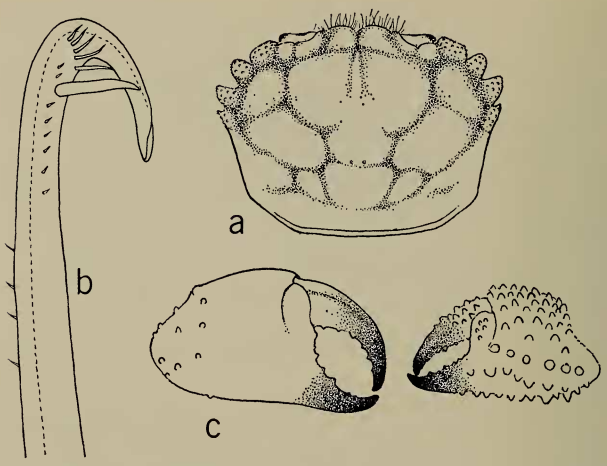
Heteropilumnus mikawaensis new species

Text-fig. 14 a-c

One ♂, holotype (SI 125873). Off Mikawa, Aichi Prefecture, depth 100–150 m. Coll. by H. Hayashi of the Odawara Carcinological Museum, Tokyo.

Diagnosis: The entire animal is sparingly covered with long hairs; the carapace is laterally subquadrate, its dorsal surface being vaulted on the anterior surface and almost flat from side to side in the middle and posterior surfaces. The regions are only obscurely defined. The front consists of two lobes, fringed with long hairs.

The anterolateral borders are cut into four teeth, of which the first is entirely confluent with the external orbital angle and its free edge is



TEXT-FIG. 14. *Heteropilumnus mikawaensis* new species. a. Carapace of male holotype viewed from dorsal side. b. Anterior male pleopod. c. Chelipeds viewed from outer side. (a × 3.2; b × 70; c × 2.7)

obliquely cut, the second and third are obtuse and well-separated, the fourth is very small and acuminate. These four teeth are granulated when viewed under the microscope.

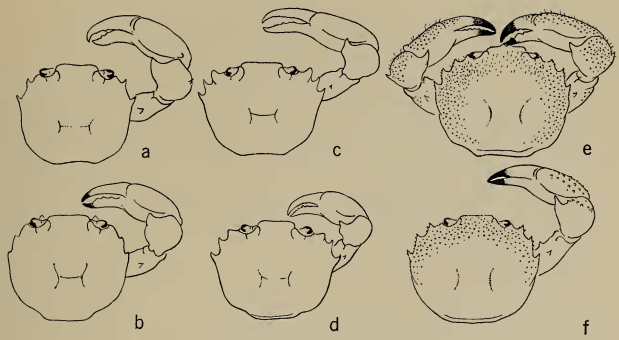
The left cheliped is small and the carpus, propodus and the proximal portion of the dactylus are studded with tubercles; the left cheliped is much larger than the right, the propodus being very heavy and the outer proximal surface with a few tiny scattered tubercles; otherwise the entire surface is smooth.

The ambulatory legs are very slender, each segment being flattened. Both anterior and posterior borders are thickly fringed with hair.

The male abdomen is seven-segmented, the first and third segments very broad as usual, and the fourth to seventh very narrow. The first male pleopod is looped near the apex and its inner border is beset with several setae, one of which is strikingly thick and long as shown in text-figure 14 b.

Measurements: Length of carapace 9.8 mm, width of same 13.6 mm.

Relationship: This new species appears to be related to *H. trichophorus* (de Man, 1895) from Malakka, but the entire body is not tomentose and the carapace is fairly well areolated; the anterolateral teeth are, unlike that species, covered with granules. The ambulatory legs are much more slender.



Text-fig. 15. Six species of *Carcinoplax* from Philippines: a. *C. bispinosa* Rathbun. Type male. b. *C. angusta* Rathbun. Type female. c. *C. specularis* Rathbun. Type male. d. *C. verdensis* Rathbun. Type female. e. *C. confragosa* Rathbun. Type female. f. *C. spinosissima* Rathbun. Type male. (a × 1.3; b × .8; c × .9; d × 1.5; e × .5; f × .7)

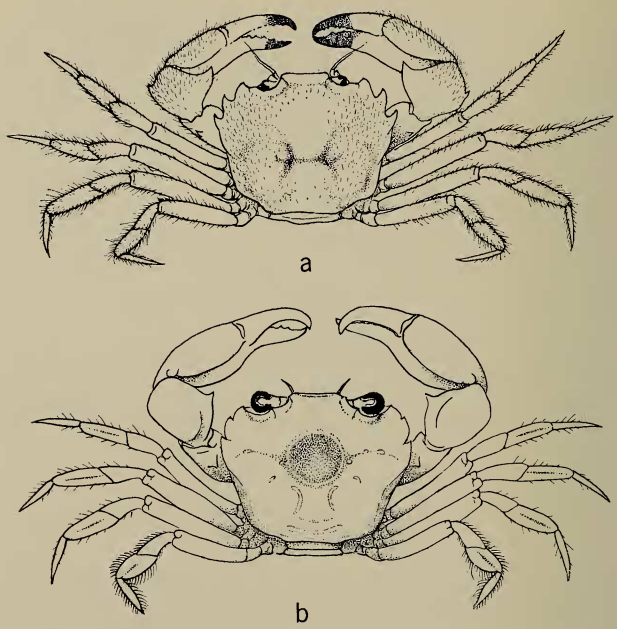
Family Goneplacidae Dana
Genus *Carcinoplax* H. Milne-Edwards

At present, the Indo-Pacific genus *Carcinoplax* contains about 16 species including one subspecies. Some of these species are insufficiently recognized and have not yet been illustrated. In my opinion, these species are divided into three groups on the basis of the form of the orbital and anterolateral teeth.

In the first or typical group, which has the carapace rather vaulted fore and aft, the anterolateral borders are armed with three teeth, the first of which arises at the external orbital angle, and the second and third are rather dentiform, having the tips sharply pointed. In some species, however, these teeth are obliterated in the fully grown stage.

The following species belong to this group:

Carcinoplax longimanus (de Haan, 1835)
C. vestitus (de Haan, 1835)
C. eburnea Stimpson, 1858
C. longimanus indicus Doflein, 1904
C. purpurea Rathbun, 1914
C. bispinosa Rathbun, 1914
C. angusta Rathbun, 1914
C. meridionaris Rathbun, 1923
C. victoriensis Rathbun, 1923
C. surugensis Rathbun, 1932
C. inaequalis (Yokoya, 1933)



TEXT-FIG. 16. a. *Carcinoplax tomentosa* new species. Dorsal view of male holotype. (× 1.4) b. *Psopheticoides sanguineus* new genus, new species. Dorsal view of male holotype. (× 1.2)

In the second group, which has the carapace rather depressed, the anterolateral borders are armed with three dentiform teeth, the first of which is obtuse or transverse in form, and is clearly separated from the external orbital margin by a connecting ridge.

The following species belong to this group:

Carcinoplax longipes (Wood-Mason, 1891)
C. verdensis Rathbun, 1914
C. specularis Rathbun, 1914
C. tomentosa new species

In the third group, which has the carapace vaulted fore and aft, and the entire body tomentose and granulated, the anterolateral borders are armed with four spinulated teeth, the first of which is the external orbital one. This group seems to be aberrant and should possibly be separated from the typical *Carcinoplax*.

The following species belong to this group:

Carcinoplax confragosa Rathbun, 1914
C. spinosissima Rathbun, 1914

By permission of the Smithsonian Institution, the types of six Philippine species of *Carcinoplax* described by Rathbun are illustrated for the first time in text-fig. 15.

Carcinoplax tomentosa new species

Text-figs. 16a; 17c; 18a.

One ♂, holotype (SI 125872). Off Mimase, Tosa Bay, depth 150–200 m. Coll. by K. Sakai.
Three ♀ ♀. Same locality, depth 100 m. Same collector.
One ♀ (photo). Osaka Bay. Coll. by H. Kohno of the Osaka Municipal Museum.

Diagnosis: A medium-sized crab. The entire animal is covered with thin, soft hairs. The carapace is sensibly broader than long, the surface depressed and the regions scarcely delimited. The front protrudes forward beyond the level of the preorbital angles and its free edge is truncate, the median fissure being obscure. The upper orbital margin is transverse in its outer half and directed rather obliquely forward.

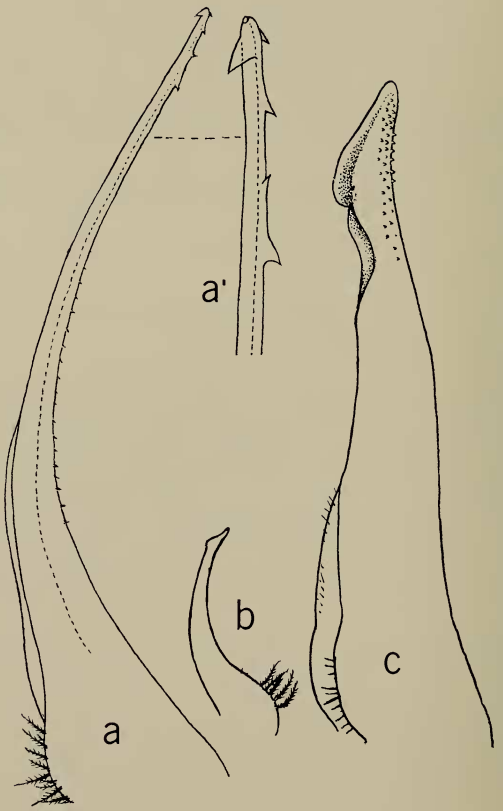
The anterolateral border is cut into three teeth; the first tooth is broadly truncate and independent, being separated from the outer edge of the orbital margin by a connecting ridge; the second and third teeth are pointed with their tips directed forwards. The posterolateral margins are a little longer than the anterolateral, and are slightly convergent backwards.

Chelipeds are heavy and almost symmetrical; the merus is rather thin and prismatic, with a tiny process near the distal end of the upper inner ridge; the carpus is rhomboidal in outline with its inner angle armed with a strong tooth, and its outer border armed with a tiny spine; the propodus is inflated on the outer surface and its upper inner border is obscurely cristate; the fingers are nearly as long as the propodus, their distal half being pigmented and their prehensile edges sharply denticulated.

The anterior three pairs of ambulatory legs are subequal in length and their dactyli are slender, slightly depressed and lanceolated. The last pair of legs are distinctly shorter and the propodus and dactylus are broader than in the preceding pairs. The male abdomen is triangular in outline and the terminal segment is longer than any of the other segments.

Measurements: Length of carapace 24.7 mm, width of same 31.5 mm.

Relationship: In the form of the front and anterolateral teeth, the new species appears to be closely related to *C. specularis* Rathbun, but the entire body is tomentose and the anterior pleopod of the male is spatulated and obtusely projecting at the tip; in *C. specularis*, the distal portion of the same appendage is obtusely bilobate.

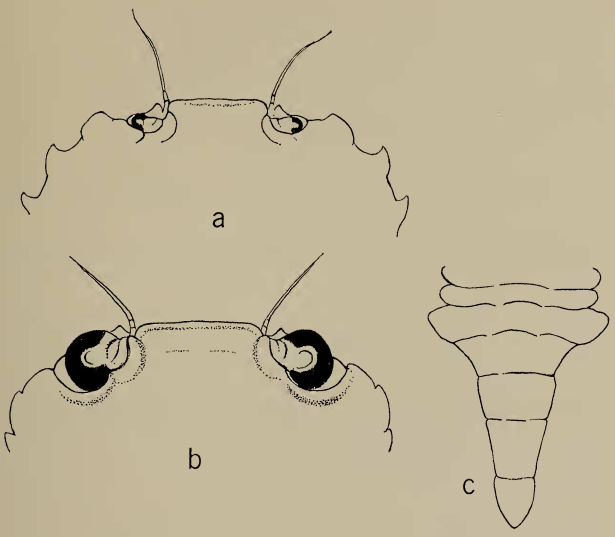


Text-fig. 17. a, a'. Anterior pleopod of male of *Psopheticoides sanguineus* new genus, new species b. Posterior pleopod of same. c. Anterior pleopod of male of *Carcinoplax tomentosa* new species. (a × 13; a' × 52; b × 13; c × 12)

Genus **Psopheticoides** new genus

Type-species: *Psopheticoides sanguineus* new species.

This new genus is allied to *Carcinoplax* H. Milne-Edwards, *Psopheticus* Wood-Mason and *Eucrate* de Haan.



TEXT-FIG. 18. a. Anterior part of carapace of *Carcinoplax tomentosa* new species. b. Same of *Psopheticoides sanguineus* new genus, new species. c. Male abdomen of *Psopheticoides sanguineus* new genus, new species. (a × 1.4; b × 2.1; c × 3.8)

In its general features, the carapace of the new genus is related to *Carcinoplax*, but the dorsal surface is depressed and the anterolateral borders are more strongly arched and cut into three cristate, lobular teeth, the anterior two of which are sometimes confluent. The posterolateral borders are markedly convergent backwards and concave.

The eyes and orbits are peculiar and resemble those of *Psopheticus*. The eye-stalks are short and thick and the cornea very large and inflated. The orbits are very large and deep to accommodate the large cornea; the upper orbital margins are strikingly sinuous.

The abdomen and pleopods are related to those of *Eucrate*, the male abdomen being very narrow and elongate in outline, composed of seven distinct segments. The anterior male pleopod is very long and thin, and its apex armed with a hook; the posterior one is very short and its tip slanting. In *Carcinoplax* and *Psopheticus*, the male abdomen is broadly triangular in outline and the anterior male pleopod is rather flat and

spatulate at the tip; the posterior pleopod is as long as or longer than the first and its tip bifurcated.

The dactylus of the 4th ambulatory legs is flat and somewhat lanceolate, suggesting relationship with the genera of Catoptrinae.

Psopheticoides sanguineus new species

Text-figs. 16b; 17a; 18b,c

One ♂, 1 ♀, the male (SI 125888) is designated as the holotype. Mimase, Tosa Bay, depth 100–150 m. Coll. by K. Sakai.

Diagnosis: This new species is peculiar in having a round, deep red spot, surrounded by a white rim, in the center of the carapace. The carapace is anteriorly broad and the posterolateral borders convergent backwards. The frontal margin is truncate, about one-fourth the greatest width of the carapace; there is no median notch. The anterior end of the orbital eave has a small tooth, which is separated from the edge of the front by an indistinct fissure.

The anterolateral borders are markedly arched, somewhat cristate and cut into three lobes (in one female, the left side has only two lobes, the first and second ones being fused together).

The chelipeds are heavy and symmetrical; the merus is rather short and its upper border obscurely ridged, with a subterminal tooth. The carpus is thick, as long as the merus, and has a sharp spiniform process near the middle of the inner border. The propodus is also very thick, the fingers are not pigmented, the prehensile edges are armed uniformly with small sharp teeth. The anterior three pairs of ambulatory legs are subequal in length and thickness. The last pair is a little shorter and the carpus distally broad, the propodus moderately broad and flattened and the dactylus somewhat lanceolate in form. The propodus and dactylus are haired along both margins.

The abdomen of the male is slender, the 4th to 7th terga being narrow, and the general outline resembles that of *Eucrate*. The anterior male pleopod is very slender and its distal portion armed with a hook at the tip, and four tiny spinules on the outer margin. The posterior pleopod is very short and its distal portion slanting.

Measurements: Length of carapace of male holotype, 20.5 mm, width of same 26 mm.

Relationship: In general features of the body, the new species seems to be related to *Pilumnoplax cooki* Rathbun 1906 from Hawaii, but the latter species has the eyestalks slender and the cornea not at all inflated, and the dactylus of the last pair of ambulatory legs slender and not lanceolated.

The Indian species, *Nectopanope rhodobathes* Wood-Mason also seems to be allied to the new species, but the carapace is not broadened anteriorly and the eyestalks are slender. Also, the cornea is not markedly inflated.

Family Pinnotheridae Dana

Genus **Orthotheres** new genus

Type-species: *Orthotheres turboe* new species.

Among numerous species of the genus *Pinnotheres*, some are unusual in having the dactylus of the external maxilliped very small and inserted at the end of the propodus. This is unlike the usual features of the genus, in which the dactylus is stiliform and inserted on the inner side of the propodus. In such unusual species, the carapace of the female is appreciably broader than long and the dactylus of all pairs of ambulatory legs uniformly very short and sharply hooked.

Ecologically, such species are found in the stomach of gastropods, but some are found in bivalve mollusks as in the common species of *Pinnotheres*.

In the classification of the genera of the Pinnotheridae, the shape of the dactylus and its position relative to the propodus of the external maxilliped are regarded as important criteria. The author takes the present opportunity to establish a new genus to accommodate such unusual species, separating them from the genus *Pinnotheres*, and designating the new Japanese species, *Orthotheres turboe* as the type-species.

At least, the following American species may be safely included in the new genus:

Pinnotheres serrei Rathbun ..... Host: *Strombus*.
P. barbatus Rathbun ..... Host: *Turbo*.
P. strombi Rathbun ..... Host: *Strombus*.

Among the Indo-Pacific species, the following may be included in the new genus, although the carapace is rather narrow and the host is either a bivalve mollusk or unknown.

Pinnotheres longipes Bürger ..... Host: unknown.
P. laevis Bürger ..... Host: *Coralliophaga*.

Orthotheres turboe new species

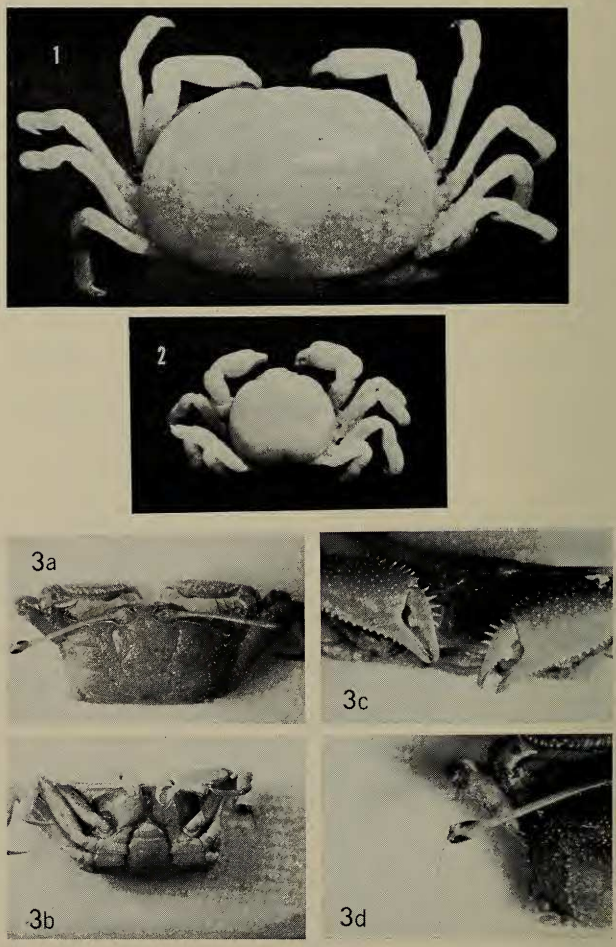
Pl. II, figs. 1, 2; text-fig. 19a.

Three ♂♂, 3 ♀♀, one female (SI 125889) is designated as the holotype. Yoron Island, Amami Group. Coll. by K. Sakai and H. Yamada.

Description of female: The entire animal is soft, as in the usual species of *Pinnotheres*. The coloration in the living stage is light lemonish white. The carapace is very broad and transversely elliptical and anteriorly convergent; the ratio between length and breadth is 1 : 1.5. The dorsal surface is evenly convex and smooth; the front is declivous, its margin being slightly bilobate. The anterolateral borders are markedly divergent backwards; the posterior margin is very broad, a little convex in the middle.

The dactylus of the external maxillipeds is very small and slightly curved inward near the tip, inserted at the end of the propodus.

The chelipeds are stout and longer than any of the ambulatory legs; the



Explanation of Plate II

Fig. 1. *Orthotheres turboe* new genus and species. Female holotype, dorsal views. × 3.5.

Fig. 2. *Orthotheres turboe* new genus and species. Male allotype, dorsal view. × 3.

propodus is distally thickened and the dactylus armed with a tooth near the proximal end of the prehensile edge. The movable finger is unarmed.

The anterior three pairs of ambulatory legs are subequal in length; the last pair is slightly more slender and shorter than the preceding ones. The dactylus of all pairs is uniformly short and hooked at the tip.

Measurements: Length of carapace 8.5 mm, width of same 13 mm.

Host: *Turbo* (*Marmarostoma*) *argyrostomus* (Linné); found in the stomach.

Description of male: The male is always living with the female in the stomach of the same host. The entire body is fairly well calcified. The carapace is narrower than in the female, rounded quadrangular in outline. The ratio between length and breadth is approximately 1 : 1. The front protrudes well-beyond the level of the eyes, its margin being obtuse and obscurely bilobate.

The chelipeds are robust and the propodus distally thickened; the movable finger is strikingly curved inward at the tip and armed with a tooth near the proximal portion of the prehensile edge. The movable finger is unarmed. The features of the ambulatory legs are almost the same as in the female. In the male of *Pinnotheres*, the ambulatory legs are usually haired along the anterior and posterior borders of the carpus, propodus and dactylus, but in the present case, all such segments are naked.

Measurements: Length of carapace 5.0 mm, width of same 5.1 mm.

Host: Same as the female.

Remarks: The same crab was formerly described by K. Nakasone from the Palao Island (1937, Nanyo Suisan Jyoho, no. 1, p. 32), but no name was given by the writer. The host was also *Turbo* (*Marmarostoma*) *argyrostomus* (Linné).

Genus *Sakaina* Sérène

The genus *Sakaina* was established by Sérène on the basis of S. *japonica*, which is related to S. *asiatica* (Sakai). The author takes the present opportunity to add a new species to this genus, which was obtained on the coast of Manazuru, Sagami Bay.

Sakaina incisa new species

Text-figs. 19b; 20

Two ♂♂, 2 ♀♀, one male (SI 125878) is designated as the holotype. Manazuru, Sagami Bay, rocky shore. Coll. by the author.

Diagnosis: A tiny species like other congeners. In general view the new species is closely related to S. *japonica* Sérène and also to S. *asiatica*

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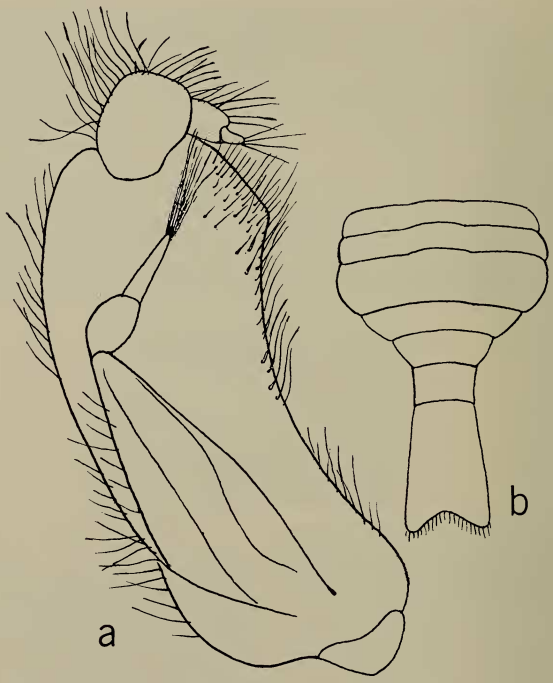
Fig. 3. *Macrophthalmus* (*Macrophthalmus*) *ceratophorus* new species. Male holotype: a. General view of carapace and thoracic legs in dorsal view. × 1.4. b. Ventral view of carapace showing the abdomen. × 1.2. c. Chelipeds viewed from outside. × 2.8. d. Left half of carapace showing the eyestalk with its palp. × 2.8.
× 1.

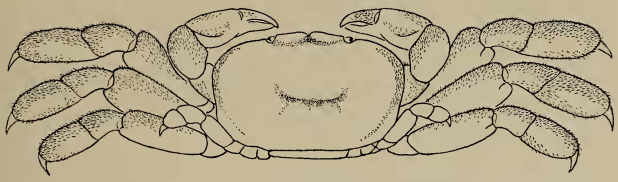


Text-fig. 19. a. External maxilliped of *Orthotheres turboe* new genus, new species. b. Male abdomen of *Sakaina incisa* new species. (a × 70; b × 20)

(Sakai). The carapace is transversely quadrilateral. The front protrudes slightly beyond the eyes and is medially notched. Just behind the frontal lobes the anterior surface of the carapace is defined by a rim of pubescence.

The anterior half of the anterolateral border is evenly rounded, with a thick rim of marginal pubescence which, however, unlike that of *S. asiatic* or *S. japonica*, does not reach the external orbital portion. The dorsal surface is smooth and glabrous.

The chelipeds are symmetrical, the merus small, and the carpus swollen with its upper inner angle very slightly produced. The propodus is also swollen and its upper inner edge is slightly cristate; the fingers are unarmed.



TEXT-FIG. 20. *Sakaina incisa* new species. Dorsal view of male holotype. (× 7)

The anterior two pairs of ambulatory legs are subequal in length and thickness; the third pair is shorter and more slender, and the last pair is strikingly reduced. The abdomen is peculiar in that the terminal segment of the male is oblong and incised at the distal end. In *S. japonica* it is truncate and in *S. asiatica* it is rounded.

Measurements: Length of carapace 2.5 mm, width of same 4 mm.

FAMILY OCYPODIDAE ORTMANN

Genus *Macrophthalmus* Latreille

In 1967, Barnes revised the species of the genus *Macrophthalmus* and divided it into six subgenera—*Macrophthalmus*, *Mareotis*, *Mopsocarcinus*, *Venitus*, *Hemiplax* and *Tasmanoplax*; the number of species comprised in these subgenera are 41 in all. Of these species, four (*Macrophthalmus transversus* (Latreille, 1817); *M. telescopicus* (Owen, 1839); *M. latipes* Borradaile, 1903; *M. milloti* Crosnier, 1965) are peculiar in having the eye-stalks particularly long and reaching far beyond the external orbital angle. A new species from Japan, described below, belongs to this small group and is unusual in having a segmented palp on the distal end of the long eye-stalk.

With regard to the subgeneric status, the new species agrees most closely with the chacteristics of *Macrophthalmus* in having the anterior boundary of the buccal frame produced into a process in the median portion; the teeth of the lateral margin of the carapace are basally narrowed and pointed; and, finally, the male abdomen relatively broad. In some respects, however, the new species represents the characteristics of the subgenus *Mareotis*, viz., the carapace being narrower, the ratio between length and width approximately 1 : 1.5, and the branchial region marked with two longitudinal rows of granules, and finally, the outer surface of the propodus of the chelipeds marked with a ridge of granules along the inferior border.

A patch of soft hair found on the inner surface of the propodus of the chelipeds suggests the relation of this species to the subgenus *Hemiplax*.

Macrophthalmus (Macrophthalmus) ceratophorus new species

Pl. II, figs. 3a–d

One ♂, holotype (SI 125879). Shimogusui, Kii Province. Coll. by H. Hayashi of the Odawara Carcinological Museum, Tokyo.
One ♂ (photo). Gokashyo Bay, Mie Prefecture. Col. by S. Tanaka of the Board of Education, Mie Prefecture.

Diagnosis: The carapace is quadrilateral, the lateral borders slightly convergent backwards. The dorsal surface is rather depressed; the gastric region is well-defined by a distinct groove on either side and its surface is glabrous and punctate. The branchial regions are declivous on the outer half and granulated; there are two longitudinal rows of granules subparallel to the lateral border. The front is strongly constricted between the bases of the eye-stalks and its free edge is bilobed and deflexed. The external orbital tooth is not strong but sharp and is followed by two indistinct teeth; otherwise the lateral border is unarmed.

The anterior boundary of the buccal frame is clearly produced into an obtuse process, which is a principal criterion of the subgenus *Macrophthalmus* as defined by Barnes.

The eye-stalks are peculiar to this species, being much longer than the carapace and their tips reaching far beyond the external orbital angle. At the distal end, there is a thin palp composed of eight segments.

The chelipeds are also peculiar to this species; the merus is slender and its anterior border finely granulated and sparingly setose; the carpus is small, its inner angle being armed with a spine and its outer border armed with several small obtuse spines; its inner surface is granulated and furnished with a patch of soft tomentum near the distal portion. The immovable finger is unarmed and its prehensile edge almost entire, while the movable finger bears five long spines on the superior margin and a large tooth near the proximal end of its prehensile edge.

The male abdomen is rather wide, the penultimate segment having an obtuse tubercle on each outer border; the terminal segment is rounded at its distal end. The anterior male pleopod has an apical process furnished with long hairs.

Measurements: Length of carapace 19.5 mm, width of same 31 mm.

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